

## SEQUENCE LISTING

<110> Thibeault, Diane  
 Lamarre, Daniel  
 Maurice, Roger  
 Pilote, Louise  
 Pause, Armin  
  
 <120> Purified Active HCV NS2/3 Protease  
  
 <130> 13/082-1-D1  
  
 <150> US 10/017,736  
 <151> 2001-12-14  
  
 <150> US 60/256,031  
 <151> 2000-12-15  
  
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| Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Ile Gly |     |
| 1 5 10 15   |     |
| ctt gca ctc ttg acc ttg tca cca tac tat aaa gtg ctc ctc gct agg | 96  |
| Leu Ala Leu Leu Thr Leu Ser Pro Tyr Tyr Lys Val Leu Leu Ala Arg |     |
| 20 25 30  |     |
| ctc ata tgg tgg tta cag tat tta atc acc aga gtc gag gcg cac ttg | 144 |
| Leu Ile Trp Trp Leu Gln Tyr Leu Ile Thr Arg Val Glu Ala His Leu |     |
| 35 40 45  |     |
| caa gtg tgg atc ccc cct ctc aat gtt cgg gga ggc gcg gat gcc atc | 192 |
| Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Ile |     |
| 50 55 60  |     |
| atc ctc ctc acg tgc gca gtc cac cca gag cta atc ttt gac atc acc | 240 |
| Ile Leu Leu Thr Cys Ala Val His Pro Glu Leu Ile Phe Asp Ile Thr |     |
| 65 70 75 80   |     |
| aaa ctc ctg ctc gcc ata ttc ggt ccg ctc atg gtg ctc cag gca ggc | 288 |
| Lys Leu Leu Leu Ala Ile Phe Gly Pro Leu Met Val Leu Gln Ala Gly |     |
| 85 90 95  |     |
| ata acc aaa gtg ccg tac ttc gtg cgt gcg cag ggg ctc att cgt gcg | 336 |
| Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg Ala |     |

| 100   | 105 | 110 |      |
|---|-----|-----|------|
| tgt atg ttg gtg cgg aag gct gcg ggg ggt cat tat gtc caa atg gcc<br>Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met Ala<br>115 | 120 | 125 | 384  |
| ttc atg aag cta gct gcg ctg aca ggt acg tac gtt tat gac cat ctc<br>Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu<br>130 | 135 | 140 | 432  |
| act cca ttg cag gat tgg gcc cac gcg ggc cta cga gac ctt gca gtg<br>Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val<br>145 | 150 | 155 | 480  |
| gcg gta gag ccc gtc atc ttc tct gac atg gag gtc aag atc atc acc<br>Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile Thr<br>165 | 170 | 175 | 528  |
| tgg ggg gcg gac acc gcg gca tgc ggg gac atc att tca ggt ctg ccc<br>Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu Pro<br>180 | 185 | 190 | 576  |
| gtc tcc gct cga agg gga agg gag ata ctc ctg gga ccg gcc gat aat<br>Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Asn<br>195 | 200 | 205 | 624  |
| ttt gaa ggg cag ggg tgg cga ctc ctt tgc ccc atc acg gcc tac tcc<br>Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser<br>210 | 215 | 220 | 672  |
| caa cag aca cgg ggc cta ctt ggt tgc atc atc acc agc ctc aca ggc<br>Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly<br>225 | 230 | 235 | 720  |
| cgg gac aag aac cag gtc gag ggg gag gttcaa gtg gtc tcc acc gct<br>Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala<br>245  | 250 | 255 | 768  |
| aca caa tct ttc ctg gcg acc tgc gtc aac ggc gtg ttt act gtc<br>Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val<br>260     | 265 | 270 | 816  |
| ttc cat ggc ggc tca aag acc ttg gcc ggc ccc aaa ggc cca atc<br>Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile<br>275     | 280 | 285 | 864  |
| acc cag atg tac act aat gtg gac cag gac ctc gtc ggc tgg cag gcg<br>Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala<br>290 | 295 | 300 | 912  |
| ccc cct ggg gcg cgc tcc atg aca cca tgc acc tgc ggc agc tcg gac<br>Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser Asp<br>305 | 310 | 315 | 960  |
| ctc tat ttg gtc acg aga cat gcc gac gtc att ccg gtg cgc cgg cgg<br>Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg<br>325 | 330 | 335 | 1008 |

|   |      |     |     |
|---|------|-----|-----|
| ggc gac agt agg ggg agc ctg ctc tcc ccc agg cct gtc tcc tac ttg | 1056 | Gly |     |
| Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu     |      |     |     |
| 340   | 345  | 350 |     |
| aag ggc tct tcg ggt ggc cca ctg ctc tgc cct tcg ggg cac gct gtg | 1104 |     |     |
| Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val |      |     |     |
| 355   | 360  | 365 |     |
| ggc atc ttc cgg gct gct gtg tgc acc cgg ggg gtt gca aaa gcg gtg | 1152 |     |     |
| Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val |      |     |     |
| 370   | 375  | 380 |     |
| gac ttc ata cct gtt gag tct atg gaa act acc atg cgg act agt agc | 1200 |     |     |
| Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser Ser |      |     |     |
| 385   | 390  | 395 | 400 |
| gct tgg cgt cac ccg cag ttc ggt ggt taa                         | 1230 |     |     |
| Ala Trp Arg His Pro Gln Phe Gly Gly *                           |      |     |     |
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| <211> 409   |      |     |     |
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| 1   | 5    | 10  | 15  |
| Leu Ala Leu Leu Thr Leu Ser Pro Tyr Tyr Lys Val Leu Leu Ala Arg |      |     |     |
| 20  | 25   | 30  |     |
| Leu Ile Trp Trp Leu Gln Tyr Leu Ile Thr Arg Val Glu Ala His Leu |      |     |     |
| 35  | 40   | 45  |     |
| Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Ile |      |     |     |
| 50  | 55   | 60  |     |
| Ile Leu Leu Thr Cys Ala Val His Pro Glu Leu Ile Phe Asp Ile Thr |      |     |     |
| 65  | 70   | 75  | 80  |
| Lys Leu Leu Leu Ala Ile Phe Gly Pro Leu Met Val Leu Gln Ala Gly |      |     |     |
| 85  | 90   | 95  |     |
| Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg Ala |      |     |     |
| 100   | 105  | 110 |     |
| Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met Ala |      |     |     |
| 115   | 120  | 125 |     |
| Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu |      |     |     |
| 130   | 135  | 140 |     |
| Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val |      |     |     |
| 145   | 150  | 155 | 160 |
| Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile Thr |      |     |     |
| 165   | 170  | 175 |     |

Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu Pro  
 180 185 190  
 Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Asn  
 195 200 205  
 Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser  
 210 215 220  
 Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly  
 225 230 235 240  
 Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala  
 245 250 255  
 Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val  
 260 265 270  
 Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile  
 275 280 285  
 Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala  
 290 295 300  
 Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser Asp  
 305 310 315 320  
 Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg  
 325 330 335  
 Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu  
 340 345 350  
 Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val  
 355 360 365  
 Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val  
 370 375 380  
 Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser Ser  
 385 390 395 400  
 Ala Trp Arg His Pro Gln Phe Gly Gly  
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|---|-----|
| ggc ata acc aaa gtg ccg tac ttc gtg cgt gcg cag ggg ctc att cgt<br>Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg<br>20 25 30        | 96  |
| gcg tgt atg ttg gtg cggt aag gct gcg ggg ggt cat tat gtc caa atg<br>Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met<br>35 40 45       | 144 |
| gcc ttc atg aag cta gct gcg ctg aca ggt acg tac gtt tat gac cat<br>Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His<br>50 55 60        | 192 |
| ctc act cca ttg cag gat tgg gcc cac gcg ggc cta cga gac ctt gca<br>Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala<br>65 70 75 80     | 240 |
| gtg gcg gta gag ccc gtc atc ttc tct gac atg gag gtc aag atc atc<br>Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile<br>85 90 95        | 288 |
| acc tgg ggg gcg gac acc gcg gca tgc ggg gac atc att tca ggt ctg<br>Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu<br>100 105 110     | 336 |
| ccc gtc tcc gct cga agg gga agg gag ata ctc ctg gga ccg gcc gat<br>Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp<br>115 120 125     | 384 |
| aat ttt gaa ggg cag ggg tgg cga ctc ctt gcg ccc atc acg gcc tac<br>Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr<br>130 135 140     | 432 |
| tcc caa cag aca cgg ggc cta ctt ggt tgc atc atc acc agc ctc aca<br>Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr<br>145 150 155 160 | 480 |
| ggc cgg gac aag aac cag gtc gag ggg gag gtt caa gtg gtc tcc acc<br>Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr<br>165 170 175     | 528 |
| gct aca caa tct ttc ctg gcg acc tgc gtc aac ggc gtg tgt tgg act<br>Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr<br>180 185 190     | 576 |
| gtc ttc cat ggc gcc tca aag acc ttg gcc ggc ccc aaa ggc cca<br>Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro<br>195 200 205         | 624 |
| atc acc cag atg tac act aat gtg gac cag gac ctc gtc ggc tgg cag<br>Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln<br>210 215 220     | 672 |
| gcg ccc cct ggg gcg cgc tcc atg aca cca tgc acc tgc ggc agc tcg<br>Ala Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser<br>225 230 235 240 | 720 |
| gac ctc tat ttg gtc acg aga cat gcc gac gtc att ccg gtg cgc cgg<br>Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg<br>245 250 255     | 768 |

|   |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
|---|------|-----|-----|---|------|---|-----|-----|-----|---|--------|---|---------|---|-----|---|-----|-----|-----------|---|---------|---|--|-----------|---------|-----|-----------|---|---------|---|-----|-----------|---------|---|-----------|---|---------|-----------|-----|---|---------|---|-----------|---|-----|---|---|---|---------|---|-----|---|----|---|-----|---|-----|---|----|---|----|---|----|---|----|---|-----|---|----|---|----|---|-----|---|-----|---|----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|--|---|-----|-----|-----|---|--|---|--|-----|-----|-----|-----|---|--|
| cgg ggc gac agt agg ggg agc ctg ctc tcc ccc agg cct gtc tcc tac | 816  |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 260   | 265  | 270 |     | ttg aag ggc tct tcg ggt ggc cca ctg ctc tgc cct tcg ggg cac gct | 864  | Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala |     | 275 | 280 | 285   |        | gtg ggc atc ttc cgg gct gtg tgc acc cgg ggg gtt gca aaa gcg     | 912     | Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala |     | 290   | 295 | 300 |           | gtg gac ttc ata cct gtt gag tct atg gaa act acc atg cgg act agt | 960     | Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser |  | 305       | 310     | 315 | 320       | agc gct tgg cgt cac ccg cag ttc ggt ggt aaa aag aaa aag taa     | 1005    | Ser Ala Trp Arg His Pro Gln Phe Gly Gly Lys Lys Lys Lys * |     | 325       | 330     |   | ggatcc    | 1011  | <210> 4 |           |     | <211> 334   |         |   | <212> PRT |   |     | <213> HCV   |   |   | <400> 4 |   |     | Met Lys Lys Lys Lys Leu Glu His His His His His His Thr Ser Ala |    | 1   | 5   | 10  | 15  | Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg |    | 20  | 25 | 30  |    | Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met |    | 35  | 40  | 45  |    | Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His |    | 50  | 55  | 60  |     | Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala |    | 65  | 70  | 75  | 80  | Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile |     | 85  | 90  | 95  |     | Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu |     | 100   | 105 | 110   |     | Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp |     | 115   | 120 | 125   |  | Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr |     | 130 | 135 | 140   |  | Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr |  | 145 | 150 | 155 | 160 | Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |  |
| 270   |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| ttg aag ggc tct tcg ggt ggc cca ctg ctc tgc cct tcg ggg cac gct | 864  |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 275   | 280  | 285 |     | gtg ggc atc ttc cgg gct gtg tgc acc cgg ggg gtt gca aaa gcg     | 912  | Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala |     | 290 | 295 | 300   |        | gtg gac ttc ata cct gtt gag tct atg gaa act acc atg cgg act agt | 960     | Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser |     | 305   | 310 | 315 | 320       | agc gct tgg cgt cac ccg cag ttc ggt ggt aaa aag aaa aag taa     | 1005    | Ser Ala Trp Arg His Pro Gln Phe Gly Gly Lys Lys Lys Lys *       |  | 325       | 330     |     | ggatcc    | 1011  | <210> 4 |   |     | <211> 334 |         |   | <212> PRT |   |         | <213> HCV |     |   | <400> 4 |   |           | Met Lys Lys Lys Lys Leu Glu His His His His His His Thr Ser Ala |     | 1   | 5 | 10  | 15      | Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg |     | 20  | 25 | 30  |     | Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met |     | 35  | 40 | 45  |    | Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His |    | 50  | 55 | 60  |     | Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala |    | 65  | 70 | 75  | 80  | Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile |     | 85  | 90 | 95  |     | Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu |     | 100   | 105 | 110   |     | Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp |     | 115   | 120 | 125   |     | Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr |     | 130   | 135 | 140   |     | Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr |  | 145   | 150 | 155 | 160 | Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |  |   |  |     |     |     |     |   |  |
| 285   |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| gtg ggc atc ttc cgg gct gtg tgc acc cgg ggg gtt gca aaa gcg     | 912  |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 290   | 295  | 300 |     | gtg gac ttc ata cct gtt gag tct atg gaa act acc atg cgg act agt | 960  | Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser |     | 305 | 310 | 315   | 320    | agc gct tgg cgt cac ccg cag ttc ggt ggt aaa aag aaa aag taa     | 1005    | Ser Ala Trp Arg His Pro Gln Phe Gly Gly Lys Lys Lys Lys *       |     | 325   | 330 |     | ggatcc    | 1011  | <210> 4 |   |  | <211> 334 |         |     | <212> PRT |   |         | <213> HCV   |     |           | <400> 4 |   |           | Met Lys Lys Lys Lys Leu Glu His His His His His His Thr Ser Ala |         | 1         | 5   | 10  | 15      | Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg |           | 20  | 25  | 30  |   | Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met |         | 35  | 40  | 45  |    | Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His |     | 50  | 55  | 60  |    | Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala |    | 65  | 70 | 75  | 80 | Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile |     | 85  | 90 | 95  |    | Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu |     | 100   | 105 | 110   |    | Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp |     | 115   | 120 | 125   |     | Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr |     | 130   | 135 | 140   |     | Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr |     | 145   | 150 | 155   | 160 | Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 300   |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| gtg gac ttc ata cct gtt gag tct atg gaa act acc atg cgg act agt | 960  |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 305   | 310  | 315 | 320 | agc gct tgg cgt cac ccg cag ttc ggt ggt aaa aag aaa aag taa     | 1005 | Ser Ala Trp Arg His Pro Gln Phe Gly Gly Lys Lys Lys Lys *       |     | 325 | 330 |   | ggatcc | 1011  | <210> 4 |   |     | <211> 334   |     |     | <212> PRT |   |         | <213> HCV   |  |           | <400> 4 |     |           | Met Lys Lys Lys Lys Leu Glu His His His His His His Thr Ser Ala |         | 1   | 5   | 10        | 15      | Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg |           | 20  | 25      | 30        |     | Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met |         | 35  | 40        | 45  |     | Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His |   | 50  | 55      | 60  |     | Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala |    | 65  | 70  | 75  | 80  | Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile |    | 85  | 90 | 95  |    | Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu |    | 100   | 105 | 110   |    | Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp |    | 115   | 120 | 125   |     | Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr |    | 130   | 135 | 140   |     | Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr |     | 145   | 150 | 155   | 160 | Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 315   | 320  |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| agc gct tgg cgt cac ccg cag ttc ggt ggt aaa aag aaa aag taa     | 1005 |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Ser Ala Trp Arg His Pro Gln Phe Gly Gly Lys Lys Lys Lys *       |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 325   | 330  |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| ggatcc  | 1011 |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| <210> 4   |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| <211> 334   |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| <212> PRT   |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| <213> HCV   |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| <400> 4   |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Met Lys Lys Lys Lys Leu Glu His His His His His His Thr Ser Ala |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 1   | 5    | 10  | 15  | Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg |      | 20  | 25  | 30  |     | Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met |        | 35  | 40      | 45  |     | Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His |     | 50  | 55        | 60  |         | Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala |  | 65        | 70      | 75  | 80        | Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile |         | 85  | 90  | 95        |         | Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu |           | 100   | 105     | 110       |     | Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp |         | 115   | 120       | 125   |     | Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr |   | 130   | 135     | 140   |     | Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr |    | 145   | 150 | 155   | 160 | Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 10  | 15   |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 20  | 25   | 30  |     | Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met |      | 35  | 40  | 45  |     | Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His |        | 50  | 55      | 60  |     | Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala |     | 65  | 70        | 75  | 80      | Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile |  | 85        | 90      | 95  |           | Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu |         | 100   | 105 | 110       |         | Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp |           | 115   | 120     | 125       |     | Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr |         | 130   | 135       | 140   |     | Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr |   | 145   | 150     | 155   | 160 | Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 30  |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 35  | 40   | 45  |     | Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His |      | 50  | 55  | 60  |     | Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala |        | 65  | 70      | 75  | 80  | Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile |     | 85  | 90        | 95  |         | Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu |  | 100       | 105     | 110 |           | Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp |         | 115   | 120 | 125       |         | Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr |           | 130   | 135     | 140       |     | Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr |         | 145   | 150       | 155   | 160 | Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 45  |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 50  | 55   | 60  |     | Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala |      | 65  | 70  | 75  | 80  | Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile |        | 85  | 90      | 95  |     | Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu |     | 100 | 105       | 110   |         | Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp |  | 115       | 120     | 125 |           | Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr |         | 130   | 135 | 140       |         | Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr |           | 145   | 150     | 155       | 160 | Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 60  |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 65  | 70   | 75  | 80  | Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile |      | 85  | 90  | 95  |     | Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu |        | 100   | 105     | 110   |     | Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp |     | 115 | 120       | 125   |         | Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr |  | 130       | 135     | 140 |           | Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr |         | 145   | 150 | 155       | 160     | Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 75  | 80   |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 85  | 90   | 95  |     | Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu |      | 100   | 105 | 110 |     | Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp |        | 115   | 120     | 125   |     | Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr |     | 130 | 135       | 140   |         | Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr |  | 145       | 150     | 155 | 160       | Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 95  |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 100   | 105  | 110 |     | Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp |      | 115   | 120 | 125 |     | Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr |        | 130   | 135     | 140   |     | Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr |     | 145 | 150       | 155   | 160     | Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 110   |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 115   | 120  | 125 |     | Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr |      | 130   | 135 | 140 |     | Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr |        | 145   | 150     | 155   | 160 | Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 125   |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 130   | 135  | 140 |     | Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr |      | 145   | 150 | 155 | 160 | Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 140   |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 145   | 150  | 155 | 160 | Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| 155   | 160  |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |
| Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr |      |     |     |   |      |   |     |     |     |   |        |   |         |   |     |   |     |     |           |   |         |   |  |           |         |     |           |   |         |   |     |           |         |   |           |   |         |           |     |   |         |   |           |   |     |   |   |   |         |   |     |   |    |   |     |   |     |   |    |   |    |   |    |   |    |   |     |   |    |   |    |   |     |   |     |   |    |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |  |   |     |     |     |   |  |   |  |     |     |     |     |   |  |

| 165   | 170 | 175 |     |
|---|-----|-----|-----|
| Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr |     |     |     |
| 180   | 185 | 190 |     |
| Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro |     |     |     |
| 195   | 200 | 205 |     |
| Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln |     |     |     |
| 210   | 215 | 220 |     |
| Ala Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser |     |     |     |
| 225   | 230 | 235 | 240 |
| Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg |     |     |     |
| 245   | 250 | 255 |     |
| Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr |     |     |     |
| 260   | 265 | 270 |     |
| Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala |     |     |     |
| 275   | 280 | 285 |     |
| Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala |     |     |     |
| 290   | 295 | 300 |     |
| Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser |     |     |     |
| 305   | 310 | 315 | 320 |
| Ser Ala Trp Arg His Pro Gln Phe Gly Gly Lys Lys Lys Lys         |     |     |     |
| 325   | 330 |     |     |

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Arg Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln  
20 25 30

Met Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp  
35 40 45

His Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu  
50 55 60

Ala Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile  
65 70 75 80

Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly  
85 90 95

Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala  
100 105 110

Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala  
115 120 125

Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu  
130 135 140

Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser  
145 150 155 160

Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp  
165 170 175

Thr Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly  
180 185 190

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Ile | Thr | Gln | Met | Tyr | Thr | Asn | Val | Asp | Gln | Asp | Leu | Val | Gly | Trp |
| 195 |     |     |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Gln | Ala | Pro | Pro | Gly | Ala | Arg | Ser | Met | Thr | Pro | Cys | Thr | Cys | Gly | Ser |
| 210 |     |     |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |
| Ser | Asp | Leu | Tyr | Leu | Val | Thr | Arg | His | Ala | Asp | Val | Ile | Pro | Val | Arg |
| 225 |     |     |     |     |     |     | 230 |     |     |     | 235 |     |     | 240 |     |
| Arg | Arg | Gly | Asp | Ser | Arg | Gly | Ser | Leu | Leu | Ser | Pro | Arg | Pro | Val | Ser |
| 245 |     |     |     |     |     |     | 250 |     |     |     |     | 255 |     |     |     |
| Tyr | Leu | Lys | Gly | Ser | Ser | Gly | Gly | Pro | Leu | Leu | Cys | Pro | Ser | Gly | His |
| 260 |     |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |     |
| Ala | Val | Gly | Ile | Phe | Arg | Ala | Ala | Val | Cys | Thr | Arg | Gly | Val | Ala | Lys |
| 275 |     |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Ala | Val | Asp | Phe | Ile | Pro | Val | Glu | Ser | Met | Glu | Thr | Thr | Met | Arg |     |
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| <400> 11 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
| Met      | Ala | Ala | Ser | Cys | Gly | Gly | Ala | Val | Phe | Ile | Gly | Leu | Ala | Leu | Leu |  |
| 1        |     |     |     | 5   |     |     |     |     |     | 10  |     |     | 15  |     |     |  |
| Thr      | Leu | Ser | Pro | Tyr | Tyr | Lys | Val | Leu | Leu | Ala | Arg | Leu | Ile | Trp | Trp |  |
| 20       |     |     |     |     |     |     | 25  |     |     |     |     | 30  |     |     |     |  |
| Leu      | Gln | Tyr | Leu | Ile | Thr | Arg | Val | Glu | Ala | His | Leu | Gln | Val | Trp | Ile |  |
| 35       |     |     |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |  |
| Pro      | Pro | Leu | Asn | Val | Arg | Gly | Gly | Arg | Asp | Ala | Ile | Ile | Leu | Leu | Thr |  |
| 50       |     |     |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |  |
| Cys      | Ala | Val | His | Pro | Glu | Leu | Ile | Phe | Asp | Ile | Thr | Lys | Leu | Leu |     |  |
| 65       |     |     |     |     |     |     | 70  |     |     |     |     | 75  |     | 80  |     |  |
| Ala      | Ile | Phe | Gly | Pro | Leu | Met | Val | Leu | Gln | Ala | Gly | Ile | Thr | Lys | Val |  |
| 85       |     |     |     |     |     |     | 90  |     |     |     |     | 95  |     |     |     |  |
| Pro      | Tyr | Phe | Val | Arg | Ala | Gln | Gly | Leu | Ile | Arg | Ala | Cys | Met | Leu | Val |  |
| 100      |     |     |     |     |     |     |     | 105 |     |     |     |     | 110 |     |     |  |
| Arg      | Lys | Ala | Ala | Gly | Gly | His | Tyr | Val | Gln | Met | Ala | Phe | Met | Lys | Leu |  |
| 115      |     |     |     |     |     |     |     | 120 |     |     |     |     | 125 |     |     |  |
| Ala      | Ala | Leu | Thr | Gly | Thr | Tyr | Val | Tyr | Asp | His | Leu | Thr | Pro | Leu | Gln |  |
| 130      |     |     |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |  |
| Asp      | Trp | Ala | His | Ala | Gly | Leu | Arg | Asp | Leu | Ala | Val | Ala | Glu | Pro |     |  |
| 145      |     |     |     |     |     |     | 150 |     |     |     |     | 155 |     | 160 |     |  |
| Val      | Ile | Phe | Ser | Asp | Met | Glu | Val | Lys | Ile | Ile | Thr | Trp | Gly | Ala | Asp |  |

| 165   | 170 | 175 |
|---|-----|-----|
| Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu Pro Val Ser Ala Arg |     |     |
| 180   | 185 | 190 |
| Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Asn Phe Glu Gly Gln |     |     |
| 195   | 200 | 205 |
| Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser Gln Gln Thr Arg |     |     |
| 210   | 215 | 220 |
| Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn |     |     |
| 225   | 230 | 235 |
| Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala Thr Gln Ser Phe |     |     |
| 245   | 250 | 255 |
| Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val Phe His Gly Ala |     |     |
| 260   | 265 | 270 |
| Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile Thr Gln Met Tyr |     |     |
| 275   | 280 | 285 |
| Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala Pro Pro Gly Ala |     |     |
| 290   | 295 | 300 |
| Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val |     |     |
| 305   | 310 | 315 |
| 320   |     |     |
| Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg |     |     |
| 325   | 330 | 335 |
| Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu Lys Gly Ser Ser |     |     |
| 340   | 345 | 350 |
| Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val Gly Ile Phe Arg |     |     |
| 355   | 360 | 365 |
| Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro |     |     |
| 370   | 375 | 380 |
| Val Glu Ser Met Glu Thr Thr Met Arg                             |     |     |
| 385   | 390 |     |
| <br>  |     |     |
| <210> 12  |     |     |
| <211> 380   |     |     |
| <212> PRT   |     |     |
| <213> HCV   |     |     |
| <br>  |     |     |
| <400> 12  |     |     |
| Ala Leu Leu Thr Leu Ser Pro Tyr Tyr Lys Val Leu Leu Ala Arg Leu |     |     |
| 1   | 5   | 10  |
| 15  |     |     |
| Ile Trp Trp Leu Gln Tyr Leu Ile Thr Arg Val Glu Ala His Leu Gln |     |     |
| 20  | 25  | 30  |
| Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Ile Ile |     |     |
| 35  | 40  | 45  |

Leu Leu Thr Cys Ala Val His Pro Glu Leu Ile Phe Asp Ile Thr Lys  
 50 55 60

Leu Leu Leu Ala Ile Phe Gly Pro Leu Met Val Leu Gln Ala Gly Ile  
 65 70 75 80

Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg Ala Cys  
 85 90 95

Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met Ala Phe  
 100 105 110

Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu Thr  
 115 120 125

Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val Ala  
 130 135 140

Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile Thr Trp  
 145 150 155 160

Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu Pro Val  
 165 170 175

Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Asn Phe  
 180 185 190

Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser Gln  
 195 200 205

Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg  
 210 215 220

Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala Thr  
 225 230 235 240

Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val Phe  
 245 250 255

His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile Thr  
 260 265 270

Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala Pro  
 275 280 285

Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu  
 290 295 300

Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly  
 305 310 315 320

Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu Lys  
 325 330 335

Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val Gly  
 340 345 350

Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp  
 355 360 365

|           |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe       | Ile | Pro | Val | Glu | Ser | Met | Glu | Thr | Thr | Met | Arg |     |     |     |     |
| 370       |     |     |     |     |     | 375 |     |     |     | 380 |     |     |     |     |     |
| <210> 13  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <211> 352 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <212> PRT |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <213> HCV |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <400> 13  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Ala       | His | Leu | Gln | Val | Trp | Ile | Pro | Pro | Leu | Asn | Val | Arg | Gly | Gly | Arg |
| 1         |     |     |     |     |     | 5   |     |     | 10  |     |     | 15  |     |     |     |
| Asp       | Ala | Ile | Ile | Leu | Leu | Thr | Cys | Ala | Val | His | Pro | Glu | Leu | Ile | Phe |
|           |     |     |     |     |     | 20  |     |     | 25  |     |     | 30  |     |     |     |
| Asp       | Ile | Thr | Lys | Leu | Leu | Ala | Ile | Phe | Gly | Pro | Leu | Met | Val | Leu |     |
|           |     |     |     |     |     | 35  |     |     | 40  |     |     | 45  |     |     |     |
| Gln       | Ala | Gly | Ile | Thr | Lys | Val | Pro | Tyr | Phe | Val | Arg | Ala | Gln | Gly | Leu |
|           |     |     |     |     |     | 50  |     |     | 55  |     |     | 60  |     |     |     |
| Ile       | Arg | Ala | Cys | Met | Leu | Val | Arg | Lys | Ala | Ala | Gly | Gly | His | Tyr | Val |
|           |     |     |     |     |     | 65  |     |     | 70  |     |     | 75  |     |     | 80  |
| Gln       | Met | Ala | Phe | Met | Lys | Leu | Ala | Ala | Leu | Thr | Gly | Thr | Tyr | Val | Tyr |
|           |     |     |     |     |     | 85  |     |     | 90  |     |     | 95  |     |     |     |
| Asp       | His | Leu | Thr | Pro | Leu | Gln | Asp | Trp | Ala | His | Ala | Gly | Leu | Arg | Asp |
|           |     |     |     |     |     | 100 |     |     | 105 |     |     | 110 |     |     |     |
| Leu       | Ala | Val | Ala | Val | Glu | Pro | Val | Ile | Phe | Ser | Asp | Met | Glu | Val | Lys |
|           |     |     |     |     |     | 115 |     |     | 120 |     |     | 125 |     |     |     |
| Ile       | Ile | Thr | Trp | Gly | Ala | Asp | Thr | Ala | Ala | Cys | Gly | Asp | Ile | Ile | Ser |
|           |     |     |     |     |     | 130 |     |     | 135 |     |     | 140 |     |     |     |
| Gly       | Leu | Pro | Val | Ser | Ala | Arg | Arg | Gly | Arg | Glu | Ile | Leu | Leu | Gly | Pro |
|           |     |     |     |     |     | 145 |     |     | 150 |     |     | 155 |     |     | 160 |
| Ala       | Asp | Asn | Phe | Glu | Gly | Gln | Gly | Trp | Arg | Leu | Leu | Ala | Pro | Ile | Thr |
|           |     |     |     |     |     | 165 |     |     | 170 |     |     | 175 |     |     |     |
| Ala       | Tyr | Ser | Gln | Gln | Thr | Arg | Gly | Leu | Leu | Gly | Cys | Ile | Ile | Thr | Ser |
|           |     |     |     |     |     | 180 |     |     | 185 |     |     | 190 |     |     |     |
| Leu       | Thr | Gly | Arg | Asp | Lys | Asn | Gln | Val | Glu | Gly | Glu | Val | Gln | Val | Val |
|           |     |     |     |     |     | 195 |     |     | 200 |     |     | 205 |     |     |     |
| Ser       | Thr | Ala | Thr | Gln | Ser | Phe | Leu | Ala | Thr | Cys | Val | Asn | Gly | Val | Cys |
|           |     |     |     |     |     | 210 |     |     | 215 |     |     | 220 |     |     |     |
| Trp       | Thr | Val | Phe | His | Gly | Ala | Gly | Ser | Lys | Thr | Leu | Ala | Gly | Pro | Lys |
|           |     |     |     |     |     | 225 |     |     | 230 |     |     | 235 |     |     | 240 |
| Gly       | Pro | Ile | Thr | Gln | Met | Tyr | Thr | Asn | Val | Asp | Gln | Asp | Leu | Val | Gly |
|           |     |     |     |     |     | 245 |     |     | 250 |     |     | 255 |     |     |     |
| Trp       | Gln | Ala | Pro | Pro | Gly | Ala | Arg | Ser | Met | Thr | Pro | Cys | Thr | Cys | Gly |
|           |     |     |     |     |     | 260 |     |     | 265 |     |     | 270 |     |     |     |

Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val  
 275 280 285  
 Arg Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val  
 290 295 300  
 Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly  
 305 310 315 320  
 His Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala  
 325 330 335  
 Lys Ala Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg  
 340 345 350  
  
 <210> 14  
 <211> 341  
 <212> PRT  
 <213> HCV  
  
 <400> 14  
 Val Arg Gly Gly Arg Asp Ala Ile Ile Leu Leu Thr Cys Ala Val His  
 1 5 10 15  
  
 Pro Glu Leu Ile Phe Asp Ile Thr Lys Leu Leu Leu Ala Ile Phe Gly  
 20 25 30  
  
 Pro Leu Met Val Leu Gln Ala Gly Ile Thr Lys Val Pro Tyr Phe Val  
 35 40 45  
  
 Arg Ala Gln Gly Leu Ile Arg Ala Cys Met Leu Val Arg Lys Ala Ala  
 50 55 60  
  
 Gly Gly His Tyr Val Gln Met Ala Phe Met Lys Leu Ala Ala Leu Thr  
 65 70 75 80  
  
 Gly Thr Tyr Val Tyr Asp His Leu Thr Pro Leu Gln Asp Trp Ala His  
 85 90 95  
  
 Ala Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Ile Phe Ser  
 100 105 110  
  
 Asp Met Glu Val Lys Ile Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys  
 115 120 125  
  
 Gly Asp Ile Ile Ser Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu  
 130 135 140  
  
 Ile Leu Leu Gly Pro Ala Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu  
 145 150 155 160  
  
 Leu Ala Pro Ile Thr Ala Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly  
 165 170 175  
  
 Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly  
 180 185 190  
  
 Glu Val Gln Val Val Ser Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys

|   |     |     |
|---|-----|-----|
| 195   | 200 | 205 |
| Val Asn Gly Val Cys Trp Thr Val Phe His Gly Ala Gly Ser Lys Thr |     |     |
| 210   | 215 | 220 |
| Leu Ala Gly Pro Lys Gly Pro Ile Thr Gln Met Tyr Thr Asn Val Asp |     |     |
| 225   | 230 | 235 |
| 240   |     |     |
| Gln Asp Leu Val Gly Trp Gln Ala Pro Pro Gly Ala Arg Ser Met Thr |     |     |
| 245   | 250 | 255 |
| Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala |     |     |
| 260   | 265 | 270 |
| Asp Val Ile Pro Val Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu     |     |     |
| 275   | 280 | 285 |
| Ser Pro Arg Pro Val Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu |     |     |
| 290   | 295 | 300 |
| Leu Cys Pro Ser Gly His Ala Val Gly Ile Phe Arg Ala Ala Val Cys |     |     |
| 305   | 310 | 315 |
| 320   |     |     |
| Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Ser Met |     |     |
| 325   | 330 | 335 |
| Glu Thr Thr Met Arg   |     |     |
| 340   |     |     |
| <210> 15  |     |     |
| <211> 292   |     |     |
| <212> PRT   |     |     |
| <213> HCV   |     |     |
| <400> 15  |     |     |
| Ala Gln Gly Leu Ile Arg Ala Cys Met Leu Val Arg Lys Ala Ala Gly |     |     |
| 1   | 5   | 10  |
| 15  |     |     |
| Gly His Tyr Val Gln Met Ala Phe Met Lys Leu Ala Ala Leu Thr Gly |     |     |
| 20  | 25  | 30  |
| 30  |     |     |
| Thr Tyr Val Tyr Asp His Leu Thr Pro Leu Gln Asp Trp Ala His Ala |     |     |
| 35  | 40  | 45  |
| 45  |     |     |
| Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Ile Phe Ser Asp |     |     |
| 50  | 55  | 60  |
| 60  |     |     |
| Met Glu Val Lys Ile Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly |     |     |
| 65  | 70  | 75  |
| 80  |     |     |
| Asp Ile Ile Ser Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile |     |     |
| 85  | 90  | 95  |
| 95  |     |     |
| Leu Leu Gly Pro Ala Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu |     |     |
| 100   | 105 | 110 |
| 110   |     |     |
| Ala Pro Ile Thr Ala Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys |     |     |
| 115   | 120 | 125 |
| 125   |     |     |

Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu  
 130 135 140  
 Val Gln Val Val Ser Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys Val  
 145 150 155 160  
 Asn Gly Val Cys Trp Thr Val Phe His Gly Ala Gly Ser Lys Thr Leu  
 165 170 175  
 Ala Gly Pro Lys Gly Pro Ile Thr Gln Met Tyr Thr Asn Val Asp Gln  
 180 185 190  
 Asp Leu Val Gly Trp Gln Ala Pro Pro Gly Ala Arg Ser Met Thr Pro  
 195 200 205  
 Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp  
 210 215 220  
 Val Ile Pro Val Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser  
 225 230 235 240  
 Pro Arg Pro Val Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu  
 245 250 255  
 Cys Pro Ser Gly His Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr  
 260 265 270  
 Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Ser Met Glu  
 275 280 285  
 Thr Thr Met Arg  
 290

<210> 16  
 <211> 303  
 <212> PRT  
 <213> HCV

<400> 16  
 Ala Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile  
 1 5 10 15  
 Arg Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln  
 20 25 30  
 Met Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp  
 35 40 45  
 Ala Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu  
 50 55 60  
 Ala Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile  
 65 70 75 80  
 Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly  
 85 90 95  
 Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala  
 100 105 110

Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala  
 115 120 125

Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu  
 130 135 140

Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser  
 145 150 155 160

Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp  
 165 170 175

Thr Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly  
 180 185 190

Pro Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp  
 195 200 205

Gln Ala Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser  
 210 215 220

Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg  
 225 230 235 240

Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser  
 245 250 255

Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His  
 260 265 270

Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys  
 275 280 285

Ala Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg  
 290 295 300

<210> 17  
 <211> 301  
 <212> PRT  
 <213> HCV

<400> 17  
 Ala Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile  
 1 5 10 15

Arg Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln  
 20 25 30

Met Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp  
 35 40 45

His Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu  
 50 55 60

Ala Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile  
 65 70 75 80

Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly

|   |     |     |
|---|-----|-----|
| 85  | 90  | 95  |
| Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala |     |     |
| 100   | 105 | 110 |
| Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu Pro Ile Thr Ala Tyr Ser |     |     |
| 115   | 120 | 125 |
| Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly |     |     |
| 130   | 135 | 140 |
| Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala |     |     |
| 145   | 150 | 155 |
| Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val |     |     |
| 165   | 170 | 175 |
| Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile |     |     |
| 180   | 185 | 190 |
| Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala |     |     |
| 195   | 200 | 205 |
| Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser Asp |     |     |
| 210   | 215 | 220 |
| Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg |     |     |
| 225   | 230 | 235 |
| Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu |     |     |
| 245   | 250 | 255 |
| Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val |     |     |
| 260   | 265 | 270 |
| Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val |     |     |
| 275   | 280 | 285 |
| Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg             |     |     |
| 290   | 295 | 300 |
| <210> 18  |     |     |
| <211> 303   |     |     |
| <212> PRT   |     |     |
| <213> HCV   |     |     |
| <400> 18  |     |     |
| Ala Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile |     |     |
| 1   | 5   | 10  |
| 15  |     |     |
| Arg Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln |     |     |
| 20  | 25  | 30  |
| Met Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp |     |     |
| 35  | 40  | 45  |
| His Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu |     |     |
| 50  | 55  | 60  |

Ala Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile  
 65 70 75 80  
 Ile Thr Trp Gly Ala Asp Thr Ala Ala Gly Asp Ile Ile Ser Gly  
 85 90 95  
 Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala  
 100 105 110  
 Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala  
 115 120 125  
 Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu  
 130 135 140  
 Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser  
 145 150 155 160  
 Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp  
 165 170 175  
 Thr Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly  
 180 185 190  
 Pro Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp  
 195 200 205  
 Gln Ala Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser  
 210 215 220  
 Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg  
 225 230 235 240  
 Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser  
 245 250 255  
 Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His  
 260 265 270  
 Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys  
 275 280 285  
 Ala Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg  
 290 295 300  
  
 <210> 19  
 <211> 11  
 <212> PRT  
 <213> HCV  
  
 <220>  
 <221> VARIANT  
 <222> (1)...(1)  
 <223> Asp labeled with anthranilyl  
  
 <221> VARIANT  
 <222> (6)...(6)  
 <223> Xaa at position 6 is Abu

```

<221> VARIANT
<222> (6)...(7)
<223> Abu-A between 6 and 7 is C(0)-O
<221> VARIANT
<222> (9)...(9)
<223> Tyr at position 9 is derivatized with 3-NO2

<400> 19
Asp Asp Ile Val Pro Xaa Ala Met Tyr Thr Trp
 1           5           10

<210> 20
<211> 6
<212> PRT
<213> HCV

<220>
<221> VARIANT
<222> (1)...(1)
<223> Asp labeled with anthranilyl

<221> VARIANT
<222> (6)...(6)
<223> Xaa at position 6 is Abu

<400> 20
Asp Asp Ile Val Pro Xaa
 1           5

<210> 21
<211> 10
<212> PRT
<213> HCV

<400> 21
Ser Phe Glu Gly Gln Gly Trp Arg Leu Leu
 1           5           10

<210> 22
<211> 20
<212> PRT
<213> HCV

<400> 22
Ser Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr
 1           5           10           15

Ser Gln Gln Thr
 20

<210> 23
<211> 10
<212> PRT
<213> HCV

<400> 23

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Ala Pro Ile Thr Ala Tyr Ser Gln Gln Thr  
1 5 10

<210> 24  
<211> 12  
<212> PRT  
<213> HCV

<400> 24  
Lys Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr  
1 5 10

<210> 25  
<211> 6  
<212> PRT  
<213> HCV

<400> 25  
Ala Pro Ile Thr Ala Tyr  
1 5